REMARKS

Claims 1 and 3-13 are pending in the application. The above amendments address the specific points of rejection raised by the examiner as further explained below. It is requested that any other remaining informality, be held in abeyance until prosecution on the merits is completed.

Claim Rejections -35 USC § 112

Claims 1 was rejected as not having sufficient support in the written description requirement. The examiner argued that there was insufficient support for ``at least one spring member'' because none of the examples in the specification showed only one spring member. In response, the applicants have amended the claims to recite a plurality spring members. The illustrations in the specification are mere examples of the disclosed invention.

Claim 5 was rejected due to the lack of antecedent basis in the written specification for the one-piece unitary construction, which was illustrated in Fig. 4. In response, the applicants have provided a discussion of the structure illustrated in Fig. 4 through the amendment of the first full paragraph of page 9 of the application as filed.

Claim Rejections -35 USC § 103

1. Claim 1 was rejected as being obvious in light of Brown (U.S. Pat. 780,776) in view of Sime (U.S. Pat. 1,671,956). Brown teaches the use of slotted apertures along a club face, but he does not teach the variation in stiffness of the spring members along the length of the spring members. Still further, Brown uses uniform bars, which do not have varying stiffness, and certainly not bars with reduced stiffness at the mid-portion of the bars.

In support of the above rejection, the Examiner argues that the elongated member of Brown inherently have a varying stiffness along their length ``due the spring being that the ends of the springs are reinforced by the end of the body of the putter.'' (page 3, first full paragraph of Final Rejection.) This position, however, is unsupportable under patent law or scientific principle. While it is true that the deflection of a beam is greater as one moves away from the restricted ends, this added deflection is not necessarily due to a change in stiffness of the beam. See attached page 244 of *Machinery's Handbook*, 26th Edition, Industrial Press Inc., New York. Thus Brown does not inherently disclose the claimed structure.

The combination Brown and Sime was based on the fact that Sime discloses a club head with an arcuate concave recessed area behind the club face. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2143.01 (I). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. See MPEP 2143.01 (IV), citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

The Sime device does not use a plurality of spring members, and does not suggest that the use of a plurality of spring members may be used to reduce drag and allow tailoring of the stiffness, and thus the ``sweet spot'' of a golf club head. Sime discusses the general principle of reducing mass at the center of the club, but does not teach or suggest the possibility of the claimed structure that includes the use of a plurality of spring members with gaps between them and a reduction in stiffness as one progresses towards the center of the spring members.

2. Claims 3-13 were rejected as being obvious under Brown in view of Sime and in further view of Beale (U.S. Pat No. 890,836). Beale uses an insert to support a club face that is made up of wires that are in line contact with one another.

As previously stated, Brown provides no support for the varying stiffness, much less the reduction in stiffness by progressive reduction in cross section of the spring members. Accordingly, the combination of Brown and Beale do not suggest the invention claimed in claims 4, 5, 10 and 13.

Regarding claim 6, there is no support for the position that Brown and Beale have varying stiffness between the ends. The deflection of the beams would be greatest between the ends, but this is not due to a reduction in stiffness, but an increase in bending moment.

The wires of Beale will not act as beams, but merely fexible members in tension. Beale indicates that he relies on tension to provide the resiliency needed to drive the ball. There is no indication of a reduced stiffness at the mid-point of the wires or anywhere along the wires.

Regarding claims 7 and 12, the bars of Brown do not function in the same manner as the claimed spring members, and thus Brown, alone or in combination with any of the references of record does not teach or suggest the claimed invention.

Regarding claims 8 and 9, there is no admission on the record to the effect that having more than one bridge connector is merely a design choice. The examiner is merely taking the teachings of the disclosure and alleging that this is and admission of mere design choice. The specification clearly simply illustrates the many uses variations that can be achieved with the knowledge disclosed by the inventor.

CONCLUSION

In view of the above, it is submitted that the applicant has placed this application in condition for allowance or clearly defined the issues for appeal. Further examination, abeyance of any remaining informalities, and reconsideration and withdrawal of the remaining rejections and objections raised in the Examiner's Office Action is requested. Moreover, it is submitted that the claims are now in condition for allowance, and that allowance of the present application is in order and is also requested.

Should the Examiner deem that any further amendment is desirable to place this application in condition for allowance, the examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted this 4th day of January 2006,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by facsimile to the United States Patent and Trademark Office (Fax No. (571) 273-8300) on this 4th day of January, 2006,

Ramon L. Pizarro

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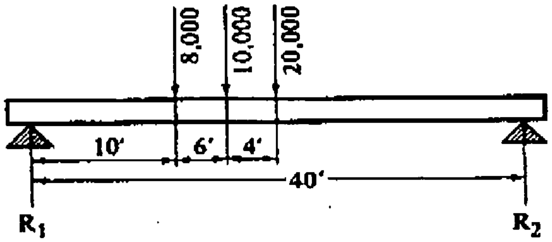
BEAMS

Beam Calculations

Reaction at the Supports.—When a beam is loaded by vertical loads or forces, the sum of the reactions at the supports equals the sum of the loads. In a simple beam, when the loads are symmetrically placed with reference to the supports, or when the load is uniformly distributed, the reaction at each end will equal one-half of the sum of the loads. When the loads are not symmetrically placed, the reaction at each support may be ascertained from the fact that the algebraic sum of the moments must equal zero. In the accompanying illustration, if moments are taken about the support to the left, then: $R_2 \times 40 - 8000 \times 10 - 10{,}000 \times 16 - 20{,}000 \times 20 = 0$; $R_2 = 16{,}000$ pounds. In the same way, moments taken about the support at the right give $R_1 = 22{,}000$ pounds.



The sum of the reactions equals 38,000 pounds, which is also the sum of the loads. If part of the load is uniformly distributed over the beam, this part is first equally divided between the two supports, or the uniform load may be considered as concentrated at its center of gravity.

If metric SI units are used for the calculations, distances may be expressed in meters or millimeters, providing the treatment is consistent, and loads in newtons. ***Note:*** **If the load is given in kilograms, the value referred to is the mass. A mass of *M* kilograms has a weight (applies a force) of *Mg* newtons, where g = approximately 9.81 meters per second^2.**

Stresses and Deflections in Beams.—On the following pages are given an extensive table of formulas for stresses and deflections in beams, shafts, etc. It is assumed that all the dimensions are in inches, all loads in pounds, and all stresses in pounds per square inch. **The formulas are also valid using metric SI units, with all dimensions in millimeters, all loads in newtons, and stresses and moduli in newtons per millimeter^2 (N/mm^2).** ***Note:*** **A load due to the weight of a mass of *M* kilograms is *Mg* newtons, where g = approximately 9.81 meters per second^2.** In the tables:

E = modulus of elasticity of the material

I = moment of inertia of the cross-section of the beam

Z = section modulus of the cross-section of the beam = $I \div$ distance from neutral axis to extreme fiber

W = load on beam

s = stress in extreme fiber, or maximum stress in the cross-section considered, due to load W. A positive value of s denotes tension in the upper fibers and compression in the lower ones (as in a cantilever). A negative value of s denotes the reverse (as in a beam supported at the ends). The greatest safe load is that value of W which causes a maximum stress equal to, but not exceeding, the greatest safe value of s

y = deflection measured from the position occupied if the load causing the deflection were removed. A positive value of y denotes deflection below this position; a negative value, deflection upward

u, v, w, x = variable distances along the beam from a given support to any point

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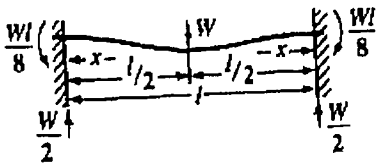
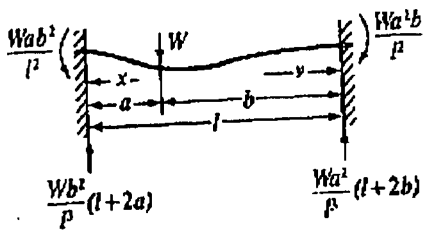
Stresses and Deflections in Beams (*Continued*)

Type of Beam	Stresses		Deflections	
	General Formula for Stress at any Point	Stresses at Critical Points	General Formula for Deflection at any Point¹	Deflections at Critical Points¹
Case 18. — Fixed at Both Ends, Load at Center				
	Between each end and load, $s = \frac{W}{2Z}(\frac{1}{4}l - x)$	Stress at ends $\frac{Wl}{8Z}$ at load $-\frac{Wl}{8Z}$ These are the maximum stresses and are equal and opposite. Stress is zero at $x = \frac{1}{4}l$	$y = \underbrace{\frac{Wx^2}{48EI}}_{\text{CONSTANTS}}(3l - 4x)$	Maximum deflection, at load, $\frac{Wl^3}{192EI}$
Case 19. — Fixed at Both Ends, Load at any Point				
	For segment of length a, $s = \frac{Wb^2}{Zl^3}[al - x(l + 2a)]$ For segment of length b, $\frac{Wl}{8Z}$	Stress at end next segment of length a, $\frac{Wab^2}{Zl^2}$ Stress at end next segment of length b, $\frac{Wa^2b}{Zl^2}$ Maximum stress is at end next shorter segment. Stress is zero at $x = \frac{al}{l + 2a}$ and $v = \frac{bl}{l + 2b}$ Greatest negative stress, at load, $-\frac{2Wa^2b^2}{Zl^3}$	For segment of length a, $y = \frac{Wx^2b^2}{6EIl^3}[2a(l - x) + l(a - x)]$ For segment of length b, $y = \frac{Wv^2a^2}{6EIl^3}[2b(l - v) + l(b - v)]$	Deflection at load, $\frac{Wa^3b^3}{3EIl^3}$ Let b be the length of the longer segment and a of the shorter one. The maximum deflection is in the longer segment, at $v = \frac{2bl}{l + 2b}$ and is $x = \frac{l_1}{W_1}(W_1 - R_1)$

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A REFERENCE BOOK
FOR THE MECHANICAL ENGINEER, DESIGNER,
MANUFACTURING ENGINEER, DRAFTSMAN,
TOOLMAKER, AND MACHINIST

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26th Edition
Machinery's Handbook

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PREFACE

For more than 85 years of continuous publication, *Machinery's Handbook* has served as the principal reference in design and manufacturing facilities, and in colleges throughout the world. The editors' objective continues to be that of making the *Handbook* a practical tool to be used in the same way that other kinds of tools are used, to make or repair products of high quality, at the lowest cost, and in the shortest time possible.

Reference works such as *Machinery's Handbook* cannot carry the same information in successive editions if they are to justify the claim that new or updated material is always presented. The editors of such a book must move with the times, keeping a finger on the pulse of manufacturing industry to learn what subjects have less, and what have more, usefulness to the majority of users. At the same time, material that is of proven worth must continue to be included if the *Handbook* is to provide for the needs of disciplines that do not develop as fast as, for instance, the numerical control field. Thus, it remains a difficult task to select suitable material from the almost limitless supply of data pertaining to the manufacturing and mechanical engineering fields, and to provide for the needs of design and production departments in all sizes of manufacturing plants and workshops, as well as those of jobbing shops, trade schools, and technical schools.

The editors rely to some extent on conversations with users of the *Handbook*, and on postcards and other written communications from *Handbook* users, for guidance on which topics should be introduced, revised, lengthened, shortened, or omitted. In response to users' suggestions, in recent years material on logarithms, trigonometry, and other topics was restored, and in this edition sine-bar tables have finally been restored after numerous requests for this topic. Also at the request of users, in 1997 the first ever large-print or "desktop" edition of the *Handbook* was published, followed in 1998 by the publication of *Machinery's Handbook CD-ROM* including several hundred additional pages of material restored from earlier editions.

Regular users of the *Handbook* should be able to identify some of the many changes embodied in the present edition. "Old style" numerals, in continuous use since the first edition, and occasionally a source of confusion for readers, have been replaced by a modern numeral style. The entire text of this edition, including all the tables and equations, has been reset, and a great many of the numerous figures have been redrawn. The addition of 80 pages brings the total length of the book to 2640 pages.

The 26th edition of the *Handbook* contains significant format changes and major revisions of existing content, as well as new material on a variety of topics including: aerodynamic lubrication, high speed machining, grinding feeds and speeds, machining econometrics, metalworking fluids, ISO surface texture, pipe welding, geometric dimensioning and tolerancing, gearing, and EDM.

Other subjects in the *Handbook* that are new or have been revised, expanded, or updated are: graphic descriptions of functions of angles, imaginary and complex numbers, complex coordinate systems, contour milling, weight of piles, Ohm's law, binary multiples, force on inclined planes, and measurement over pins.

Those users involved in aspects of machining and grinding will be interested in the new topics *MACHINING ECONOMETRICS* and *GRINDING FEEDS AND SPEEDS*, presented in the *Machining* section. The core of all manufacturing methods start with the cutting edge and the metal removal process, and improving the control of the machining process is a major component in order to achieve a **Lean chain** of manufacturing events. These sections describe the means that are necessary to get metal cutting processes under control and how to properly evaluate the decision making.

A major goal of the editors is to make the *Handbook* easier to use. The 26th edition of the *Handbook* continues to incorporate the time-saving thumb tabs, much requested by users in the past. The table of contents pages beginning each major section, first introduced for the 25th edition, have proven very useful to readers. Consequently, the number of contents pages has been increased to several pages each for many of the larger sections, more thoroughly reflecting the contents of these sections. In the present edition, the Plastics section, formerly a separate thumb tab, has been incorporated into the Properties of Materials section. A major task in assembling this edition has been the expansion and reorganization of the index. For the first time, most of the many Standards referenced in the *Handbook* are now included in the index.

The American Standards Association was reconstituted in August 1969 as the United States of America Standards Institute, and standards that had been approved as American Standards were designated as USA Standards. In October 1969, the name was changed to the American National Standards Institute. Thus, the designation of present standards is ANSI instead of ASA or USAS. Standards originally adopted by the American Standards Association and not revised are still referred to in the *Handbook* by the designation ASA.

ANSI Standards are copyrighted by the American National Standards Institute, West 42nd Street, New York, NY 10017, from whom current copies may be purchased. Many of the American National Standards Institute (ANSI) Standards that deal with mechanical engineering, extracts from which are included in the *Handbook*, are produced by the American Society of Mechanical Engineers (ASME), and we are grateful for their permission to quote extracts and to update the information contained in the standards, based on the revisions regularly carried out by the ASME. Information regarding current editions of any of these Standards can be obtained from ASME International, Three Park Avenue, New York, NY 10016.

Users who call possible defects to the attention of the editors, or the omission of some matter that is considered to be of general value, often render a service to the entire manufacturing field. We desire to increase the usefulness of the *Handbook* as far as possible, so all criticisms and suggestions about revisions, omissions, or inclusion of new material are welcome.

Christopher J. McCauley, Editor

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